Bear Creek Ranches Management Plans
Environmental Assessment # MT-050-02-01
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CHAPTER 1.0 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

1.1 Introduction and Background

This Environmental Assessment (EA) has been prepared to disclose the environmental effects of management alternatives for the grazing allotments currently leased to Bear Creek Ranches. These allotments lie on BLM, National Forest, and private lands in tributaries of the Big Sheep Creek drainage. Affected allotments include the Indian Creek, Junction, Cabin Creek, Crystal Creek, Meadow Creek Isolated, and Indian Creek Isolated Allotments. They are located on public land administered by the Dillon Field Office, and lie about 15 - 20 miles southwest of Lima, Montana. Appendix A displays vicinity and local maps of the allotments. Chapter 1 describes the proposed action, the purpose and need for the proposed action, the scope of the proposed action, and the decision to be made.

1.2 Proposed Action

The Bureau of Land Management Dillon Field Office proposes to achieve Standards for Rangeland Health to improve habitat for westslope cutthroat trout, sage grouse and antelope on allotments leased to Bear Creek Ranches. The BLM expects to implement new management strategies on the Indian Creek, Junction, Cabin Creek, Crystal Creek, Meadow Creek Isolated, and Indian Creek Isolated Allotments beginning in 2003.

1.3 Need for the Action

Through resource information collected and reviewed, the authorized officer has determined that the existing livestock management on the Bear Creek Ranches allotments is contributing to the failure to achieve or make significant progress towards the riparian and habitat standards for rangeland health developed by the Butte Resource Advisory Council. As a result livestock management on these allotments needs to be changed to ensure conformance with the Fundamentals of Rangeland Health as described in 43 CFR 4180.1. Additional information relating to conformance with rangeland health standards is presented in Chapter 3 while specific resource concerns are listed below.

- The majority of the riparian and wetland habitats on the Bear Creek allotments are functional at risk.

- Unstable streambanks and over-widened stream channels provide marginal habitat for westslope cutthroat trout in Cabin, Simpson and Brians Creeks.

- Introduced and undesirable herbaceous species are competing with desirable native plant species in riparian and wetland habitats.

- Distribution, canopy and height of big sagebrush, and lack of sufficient understory herbaceous vegetation is one of the factors limiting sage grouse nesting and early brood rearing.

1.4 Objectives of the Action

- Maintain riparian and wetland function where it is currently in properly functioning condition, and, improve riparian condition where it is currently in a non-functioning or functioning-at-risk condition.

- Maintain, restore or enhance westslope cutthroat trout habitat.

- Maintain or improve the ecological condition of upland and riparian vegetation while protecting sensitive plant species and unique plant communities

- Protect, maintain or improve sagebrush habitats to benefit sage grouse, antelope and other sagebrush dependant species.

- Contribute to economical viability of local communities by providing an opportunity for domestic livestock to be grazed on public land on an annual basis.

- Allow specified, optional, range structural improvements to give the permittee flexibility to efficiently and effectively manage the distribution of livestock and level of grazing on specific sites. Table 2-2 displays optional range improvements that are analyzed as part of the proposed action. The locations of these improvements are displayed in Appendix B.

1.5 Scope of this Environmental Analysis

1.5.1 History of the Planning and Scoping Process

The scope of the proposed action is limited to authorizing specific livestock management activities and grazing levels as described in Chapters 1 and 2. These activities are limited to BLM and National Forest lands within the affected allotments. The proposed action is not a general management plan for the area, and is not a programmatic Environmental Analysis. Implementation of this proposal is anticipated to begin in calendar year 2003, and continue for up to ten years, or until monitoring data or additional information indicates a consideration of changed condition.

Representatives of the BLM and Forest Service discussed resource opportunities and concerns on the allotments with representatives of Bear Creek Ranches Inc. during the summers of 2000 and 2001. BLM reviewed the five standards for rangeland health with Bear Creek Ranch manager and provided him with copies of draft recommendations regarding changes in management on the allotments. The planning process, timeline and relevant issues were discussed with the owner and the manager of Bear Creek Ranches in November 2001. Internal agency scoping was completed and preliminary resource issues were identified at the second interdisciplinary team meeting on December 6, 2001. A total of seven interdisciplinary team meetings were held between November 2001 and September 2002. Minutes of all meetings are contained in the project file at the Dillon Field Office.

The Bear Creek Ranches planning process was included on the Beaverhead National Forest quarterly project list under the name of Crystal Creek in October 2001. It was added to the BLM's quarterly project list in January 2002 and was carried forward on the April and July 2002 project lists.

1.5.2 Relevant Planning Documents

The proposed action is in conformance with the following planning and environmental documents.

Dillon Management Framework Plan, 1979

The Dillon Management Framework Plan guides all management actions on 955,000 acres of public land administered by the Bureau of Land Management, Dillon Field Office.

Mountain Foothills Grazing Management Program Environmental Impact Statement, 1980

The Mountain Foothills EIS guides the grazing management program on the public land administered by the Bureau of Land Management, Dillon Field Office.

Beaverhead National Forest Plan, 1986

The Forest Plan, as amended, guides all natural resource management for the Beaverhead National Forest (USDA, 1986).

Sheep Creek Habitat Management Plan, 1981

The Big Sheep Creek HMP provides stream reach specific guidance for maintaining and improving Big Sheep Creek and tributary fishery habitats.

Standards for Rangeland Health and Guidelines for Livestock Grazing Management in Montana, North Dakota and South Dakota Environmental Impact Statement, 1997.

The Standards Guidelines EIS established regional standards for rangeland health and guidelines for livestock grazing management that provide for the conformance with the fundamentals if rangeland health in the regulations (43 CFR 4180.1).

Beaverhead Forest Plan Riparian Amendment Environmental Impact Statement, 1997.

Established interim standards for forage utilization, stubble height, woody browse utilization, and stream bank trampling for all Forest riparian areas and the riparian areas on twelve BLM allotments, including the Crystal Creek allotment.

1.5.3 Issues Studied in Detail

1.5.3.1 How will riparian/wetland health & function be affected?

Domestic livestock grazing level and intensity may influence the health and function of riparian areas and wetlands. Excessive impacts may result in physical changes to stream attributes, and loss of biodiversity and changes in vegetative communities.

Indicators for this issue:

- Functioning condition of riparian areas and wetlands
- Type of vegetation present, including willow canopy and recruitment where applicable
- Physical condition of stream channels / Streambank stability

1.5.3.2 How will Westslope Cutthroat Trout Habitat be affected?

Domestic livestock grazing level and intensity may influence the function of westslope cutthroat trout (WCT) habitat. Excessive impacts may result in adverse changes to channel structure and loss of vegetation that shades streambanks.

Indicators for this issue:

- Amount of streambank alteration from livestock trampling the banks
- Height of perennial vegetation remaining along stream channels after a grazing treatment.

1.5.3.3 How will sagebrush habitats and sagebrush dependent species (sage grouse, antelope, et al) be affected?

Domestic livestock grazing level and intensity may influence the condition of sagebrush communities. Livestock grazing may affect the amount of herbaceous vegetation available to provide forage and cover for wildlife. Excessive impacts may result in decreased canopy of sagebrush, changes in understory vegetation and loss of biodiversity. Fences may create barriers to wildlife movement and may cause injury or death from impact or entanglement.

Indicators for this issue:

- Amount and type of fence
- Presence of cattle during sage grouse nesting and early brood rearing
- Amount of vegetation utilized by livestock (Height of grasses and forbs at various seasons of the year)

1.5.3.4 How will the grazing permittee's economic situation be affected?

The amount of forage available from public land for use by Bear Creek Ranches Inc. influences the total numbers of livestock the ranch can support on a year-round basis. The complexity of grazing systems or rotations influences how many employees are needed to implement various livestock management strategies. Riding, herding, project construction and maintenance and resource use monitoring represent variable costs to the permittee.

Indicators for this issue:

- Amount of forage harvested from public land annually
- Estimated costs of AUM reduction
- Labor requirements

1.5.4 Issues Eliminated from Further Study

1.5.4.1 Rangeland health including sensitive plant species habitat

The interdisciplinary team agreed that BLM's upland standard was being met on the Bear Creek allotments. Range condition and trend isn't a driving issue for this planning process. The I.D. team agreed that any remaining rangeland health concerns would be adequately discussed and addressed under the riparian and sagebrush issues.

1.6 Decisions to be Made

The Bureau of Land Management Dillon Field Manager must decide or determine:

- What level and intensity of cattle grazing will be allowed on the public lands within the Bear Creek allotments?
- What new structural improvements will be allowed to provide flexibility in grazing management?
- What modifications should be made to existing range improvements?

The Dillon Field Manager must also determine if the selected alternative would or would not be a major Federal Action, significantly affecting the quality of the human environment. If he determines that it would be, then an EIS (Environmental Impact Statement) must be prepared before the Bear Creek Management Plans could proceed.

1.7 Applicable Legal and Regulatory Requirements and Coordination

1.7.1 Legal Requirements (major laws directing this analysis process)

Taylor Grazing Act of 1934.

The Taylor Grazing Act provided a way to regulate the occupancy and use of the public land, preserve the land and its resources from destruction or unnecessary injury, and provide for orderly use, improvement, and development.

Federal Land Policy and Management Act of 1976 (FLPMA)

FLPMA provides a multiple use framework for BLM to manage the public lands in a manner that will protect the quality of scientific, ecological, and environmental values for present and future generations.

National Forest Management Act of 1976 (NFMA)

NFMA directs the Forest Service to develop an integrated resource management plan for each Forest. The Crystal Creek AMP must be updated to make it consistent with management direction in the Beaverhead National Forest Plan, as amended by the Riparian Amendment (October 1997) and to comply with the schedule for the Beaverhead National Forest Grazing Lawsuit Settlement Agreement (June 1995).

National Environmental Policy act of 1969 (NEPA)

NEPA establishes policy, goals and means for public disclosure of federal environmental decision-making.

1.7.2 Regulatory Requirements

Title 43, Code of Federal Regulations, Part 24

Sets forth Department of Interior's Fish and Wildlife Policy. For BLM, this includes conservation and rehabilitation of fish and wildlife and their habitat.

Title 43, Code of Federal Regulations, Part 4100

Provides uniform guidance for the administration on the public lands exclusive of Alaska.

Section 106 of the National Historic Preservation Act

A Class III cultural resource inventory will be required prior to the implementation of any proposed range or habitat improvements. Should significant cultural resources be identified, adverse impacts will be mitigated by project abandonment or redesign. In addition, personnel from the Bureau of Land Management should be notified of the presence and location of any cultural resources should they be encountered by the permittee during the course of grazing operations on public lands.

1.7.3 Coordination Requirements

Lynx Conservation Assessment and Strategy, and Canada Lynx Conservation Agreement.

This analysis considers the Lynx Conservation Assessment and Strategy, and Canada Lynx Conservation Agreement. This agreement provides strategies and guidelines for the conservation and Management of Canada lynx.

Memorandum of Understanding among the Western Associations of Fish and Wildlife Agencies, the Forest Service, the Bureau of Land Management and the Fish and Wildlife Service and Sage Grouse Management Guidelines.

This analysis considers the Memorandum of Understanding among the Western Associations of Fish and Wildlife Agencies, the Forest Service, the Bureau of Land Management and the Fish and Wildlife Service. This understanding provides for cooperation among the participating agencies to develop strategies for the conservation and management of sage grouse and sagebrush habitat.

Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout in Montana

This analysis considers this MOU and Conservation Agreement that was developed to expedite implementation of conservation measures for westslope cutthroat trout.

Tribal Consultation

To date, traditional cultural properties or traditional life-way values of special concern to Native American Groups have not been specifically identified within the grazing allotment. On going consultations occur with representatives of the Confederated Salish and Kootenai Tribes of the Flathead Reservation, and the Shoshone-Bannock Tribes of the Fort Hall Reservation.

CHAPTER 2.0 DESCRIPTION OF ALTERNATIVES

2.1 Introduction

This chapter describes the alternative development process, alternatives considered in detail, and alternatives considered but not given detailed study. The four alternatives considered in detail have been designed to address the resource issues identified from internal and external scoping.

This chapter compares how alternatives address each issue identified. This comparison, along with a disclosure of Environmental Consequences (Chapter 4) identifies the tradeoffs to the Authorized Officer (Field Manager) to make an informed choice between alternatives. This EA summarizes more detailed information found in the Bear Creek Allotments Project File and individual allotment and stream files. All of these files are located at the Dillon Field Office.

2.2 Process Used to Formulate the Alternatives

Alternatives were developed based upon National and State BLM direction and policy, existing condition and environmental issues. Environmental issues are discussed in section 1.5 of Chapter 1. Other factors that influenced alternative development are discussed in Chapter 3. When developing and considering alternatives, the interdisciplinary team evaluated them against the objectives of the proposed action. With the exception of the No Action alternative, alternatives that wouldn't make progress toward meeting resource objectives were dropped from further consideration. These alternatives are discussed in section 2.4.

2.3 Features Common to all Alternatives

The following features are common to all alternatives where domestic livestock grazing will be permitted except Alternative A, which is the No Action alternative. These features include mitigation measures required to reduce or eliminate adverse environmental impacts, monitoring to determine conditions and changes; and past, present and reasonably foreseeable actions that are relevant to anticipating cumulative impacts of grazing alternatives.

2.3.1 Management Actions

- The Indian Creek riparian pasture will continue to be managed for riparian and fishery habitat. It will remain closed to livestock use until such time that aquatic and riparian conditions outside the enclosure match those documented inside the enclosure in August 1991.

- Temporary electric fence, salt placement, riding, and herding may be used as a means of influencing livestock distribution in all action alternatives on all allotments.

- When used, salt blocks will be placed on ridges or terraces at least 1/4 mile from the nearest live water source.

- A Class III cultural resource inventory will be required prior to the implementation of any ground disturbing project sites. Should cultural resources be identified, adverse impacts will be mitigated by project abandonment or redesign. In addition, personnel from the Bureau of Land Management should be notified of the presence and location of any cultural resources should they be encountered by the permittee during the course of grazing operations on public lands.

- Prior to any ground disturbing activities, activity sites will be surveyed for sensitive plants. If plants are found, they will be avoided if a negative impact is determined through a biological evaluation.

- Any new or replacement boundary fences will be 4-wire fences and will have the top three wires barbed and the bottom wire smooth. Wire spacing from the ground up will be 16", 22", 28," and 40". Any new interior fences will consist of three wires (barbed or high tensile for electric fence) and the wire spacing will be 18", 26", and 38" from the ground up.

2.3.2 Monitoring

Periodic monitoring will be performed to determine resource conditions. Modification of allowable use levels will be based upon resource status and trend. Monitoring will be done according to the monitoring plan detailed in Appendix C. Two types of monitoring will be common to all grazing alternatives:

- Annual monitoring - to determine if the planned activities were accomplished, compliance with allowable use levels and terms of the grazing permit, and status of range improvements.

- Trend monitoring - to determine if an activity achieved the stated resource objectives, using appropriate sampling design and methodology to assess status and trend of the selected attributes over time.

2.3.3 Past, Present and Reasonable Foreseeable Future Actions in the Project Area

The following actions were considered for effects related to those in the proposed action. Related past, present and reasonably foreseeable effects are considered cumulatively with environmental impacts anticipated from the proposed action in Chapter 4.

- Grazing would continue to occur on the private lands within and adjacent to the Bear Creek allotments. The impacts of past, present and reasonably foreseeable grazing impacts on private and BLM lands within these allotments are considered in cumulative effects to riparian function, westslope cutthroat trout habitat and sagebrush habitats.

- Irrigation diverts water from Simpson, Indian, Meadow, Brians, Cabin, Alkali and Tex Creeks. Use of these systems to provide water to private hay meadows is anticipated

to continue into the foreseeable future. Cumulative impacts are considered for riparian function, aquatics (fisheries) and sensitive plants.

2.4 Alternatives Considered But Eliminated from Detailed Study

2.4.1 Simpson Creek Riparian Fencing Alternative

Simpson Creek (stream reach TE21) would be isolated by constructing of a 4-strand barbed wire fence paralleling the creek along the ridge to the northwest. This would create a riparian pasture/enclosure that would allow the greatest flexibility in restoring degraded riparian and aquatic habitats associated with Simpson Creek.

This alternative was dropped from consideration because the ID Team decided livestock use would be displaced to Brians Creek and associated springs and wetlands. After discussing the option of corridor fencing Brians Creek, the team decided it was best to manage the existing Simpson Creek pasture (which includes Simpson and Brians Creeks) as a riparian pasture. Additional consideration was given to the fact that mule deer, elk, antelope, moose and sage grouse have been observed in the Simpson Creek area of the Indian Creek allotment. Constructing additional fences in this area would have increased the risk of animal impact and/or entanglement.

2.4.2 Implement Beaverhead Forest Plan Standards on all BLM lands

All BLM grazing allotments would be managed by moving cattle based on the same utilization levels currently in effect on the Crystal Creek allotment (45-50% on riparian areas and 55% on uplands). Livestock would be moved to a new pasture when forage utilization standards are met.

This alternative was dropped from consideration because the ID Team decided that while these utilization levels might initiate improvement on some of the sedge dominated functional-at risk riparian habitats, they wouldn't improve woody riparian habitats. Only marginal habitat would be provided for westslope cutthroat trout and sage grouse.

2.4.3 Corridor Fence Westslope Cutthroat Trout Fisheries

At least twelve miles of fence construction would be required to provide ungrazed buffers on either side of the Simpson, Brians and Cabin Creeks. Meadow Creek (stream reach TE-45) is currently fenced and used periodically as a water gap. This alternative was dropped from consideration because the ID Team decided it would create additional wildlife barriers (See 2.4.1,) wouldn't protect non-fisheries and would cost over $30,000.00.

2.4.4 One herd, Ten Pasture Rotation

The Crystal Creek, Cabin Creek, Indian Creek and Junction allotments would be managed as one unit. Approximately 435 cattle would be managed in one herd and rotated through ten pastures. Length of stay in the pasture would be based on the surveyed grazing capacity. For example, the herd would be permitted to stay in the Simpson Creek pasture of the Indian Creek allotment for

approximately 20 days. The Meadow Creek Isolated and Indian Creek isolated allotments would continue to be managed with adjacent private lands.

This alternative was dropped from consideration because the ID Team decided excessive streambank trampling would accelerate widening or incisement of stream channels. Little herbaceous vegetation would be available for wildlife use after a grazing treatment. Riparian function and aquatic and sagebrush habitats wouldn't be maintained.

2.5 Description of Proposed Alternatives

2.5.1 Alternative A: Continue Livestock Grazing as Currently Authorized (No Action)

Livestock grazing would continue on the Bear Creek allotments for full season and numbers as currently permitted. With the exception of the Crystal Creek allotment, livestock moves would be based on calendar dates rather than on use levels. No new projects would be constructed and no modifications would be made to existing projects.

The Crystal Creek allotment would be grazed under a 3-pasture rest rotation grazing system with approximately 155 cow/calf pairs from June 1 – September 30 annually. Grazing levels in riparian areas would be based upon the Beaverhead Forest's Interim Riparian Grazing Standards. The Forest's Riparian standards allow an average 45% forage utilization adjacent to streams with westslope cutthroat trout populations, and 50% adjacent to those without. Upland grazing maximum allowable use levels would be 55%, and 35% on elk winter range. Livestock would be moved to a new pasture when forage utilization standards are met.

The Junction allotment would be grazed approximately 117 cow/calf pairs from June 1 – November 30, under an informal 4-pasture rotational-rest grazing schedule annually. Livestock would be moved from pasture to pasture based at the permittee's discretion.

The Indian Creek allotment would be grazed under a 2-pasture deferred rotation grazing system with approximately 161 cow/calf pairs from June 1 – September 15 annually. The Indian Creek riparian pasture would not be grazed. Livestock would be moved based on predetermined calendar dates or earlier, at the permittee's discretion.

The Cabin Creek allotment would be grazed by domestic livestock between June 1 and July 5 annually. Up to 60 AUMs of forage would be harvested from BLM lands within the allotment.

The Indian Creek Isolated allotment would be grazed by domestic livestock between May 20 and September 30 annually. Up to 126 AUMs of forage would be harvested from BLM lands within the allotment.

The Meadow Creek Isolated allotment would be grazed by domestic livestock between May 1 and November 30 annually. Up to 40 AUMs of forage would be harvested from BLM lands within the allotment.

2.5.2 Alternative B: No Grazing on the Bear Creek allotments

No further grazing will be permitted on any of the Bear Creek allotments upon expiration of the current grazing leases. All internal pasture fences will be removed. New boundary fences may be constructed between BLM and private lands. Water would no longer be diverted from Hewlett Spring. The Hewlett Spring pipeline would be abandoned and the water tanks removed from the Crystal Creek allotment.

2.5.3 Alternative C: Manage Livestock Grazing with Allowable Use Levels

Alternative C would graze livestock based upon site-specific allowable use levels to meet the riparian/wetland, westslope cutthroat trout habitat, and sagebrush habitat objectives. Livestock will be moved to a new pasture when any one of the riparian or upland allowable use levels presented in Table 2-1 are met on key areas. Herd size and season of use may vary, but grazing won't be allowed on any of the allotments prior to June 15 and total permitted use will not exceed the current recognized grazing preference for each allotment. (See Table 3-1.) This gives the permittee maximum flexibility in livestock numbers. Periodic yearlong rest from grazing will be afforded every management unit (pasture) at least once in four years. Specific structural range improvements presented in Table 2-2 would be allowed to give the permittee flexibility in managing the distribution and intensity of grazing across the allotments. Existing fences on BLM that are determined to limit wildlife movements would be modified to allow easier wildlife passage.

Table 2-1. Allowable Use Levels

Riparian/Wetlands	Management Objective	Utilization	Stubble Height	Upon Shift to Woody Browse	Streambank Alteration
WCT Fisheries	Provide Sensitive Species Habitat	30%	6"	Move	20'/100'
Non WCT Streams	Maintain &/or Restore Riparian Function	50%	4"	Move	30'/100'
Wetlands (Lentic)	Provide Sensitive Species Habitat	40%	6"	Move	N/A
Upland Vegetation					
Idaho fescue	Healthy rangeland / sage grouse habitat	45%	5"		
Bluebunch wheatgrass	Healthy rangeland / sage grouse habitat	45%	7"		
Thick-spike wheatgrass	Healthy rangeland / sage grouse habitat	45%	6"		

Table 2-2. Allowable Range Improvements

Improvement	Purpose	Quantity
Coyote Cross Fence	Create additional management unit (pasture)	~ 1 mile
Cabin Creek Water Gap	Limit livestock access to stream	~ 50 feet
Alkali Creek Water Gap	Limit livestock access to stream	~ 50 feet
Meadow Creek Water Gap	Limit livestock access to stream	~ 50 feet
Jack & Rail Spring Enclosures	Limit livestock access to spring sources	Variable
Modify or Replace Existing Fences	Allow easier passage of wildlife	~ 11 miles
Temporary Electric Fence	Influence livestock distribution within pastures	Variable

2.5.4 Alternative D: Extended Rest in the Simpson Creek and Indian Creek Pastures; Manage Livestock Grazing with Allowable Use Levels on all other units.

Native Trout fence would be removed and what was the Simpson Creek pasture of the Indian Creek allotment would be managed with the Indian Creek riparian pasture. Livestock grazing would be discontinued on approximately 1450 acres of BLM land. Included in the new management area would be 2.7 miles of perennial streams (stream reaches TE20, TE21, TE183) and over 50 acres of wetlands (TE234, TE237). These 1450 acres would be managed to allow for maximum vegetative expression and production, which should in turn provide optimal sage grouse and westslope cutthroat trout habitat. This area would also be used as a comparison or reference area for similar habitats and sites within southwest Montana. The potential for any future grazing would be determined during the next evaluation process. All other BLM lands in the Bear Creek allotments would be grazed based upon the site-specific allowable use levels presented in Alternative C. Livestock would be moved to new pastures when any one of the riparian or upland allowable use levels presented in Table 2-1 is met. As in alternative C, livestock numbers and season of use may vary, but grazing won't begin until June 15 or later and total permitted use will not exceed the current recognized grazing preference for each allotment.

The range improvements presented in Table 2-2 would apply to this alternative, as well as approximately 1.2 miles of fence removal.

2.6 Comparison of Alternatives

This section compares alternatives based on the resource issues. It includes a summary of environmental impacts and a table (Table 2-3) displaying of the important differences between the alternatives. A more detailed discussion of impacts, by each resource, is found in Chapter 4, Environmental Consequences.

2.6.1 Alternative A: Continue Livestock Grazing as Currently Authorized

Alternative A maintains current grazing and livestock management levels. It provides for opportunities for use of forage by domestic livestock, while offering some protection to other resources primarily by rotating livestock use through pastures so that they are grazed at different times during different years.

Alternative A applies Beaverhead National Forest interim riparian standards to protect riparian areas only on the Crystal Creek allotment. Only permitted season and numbers limit the level and intensity of livestock use in riparian habitats on the other allotments. As such, riparian areas that are functional-at risk or nonfunctional may not recover to proper functioning condition.

Alternative A has the least ability to protect westslope cutthroat trout habitat at levels to maintain the integrity of existing populations. This is because it does not designate allowable use levels specific to controlling disturbance to stream banks, as does Alternatives C and D; or eliminate livestock disturbance, as does Alternatives B and D.

Sagebrush habitats are protected the least by this alternative than others analyzed in detail. Post-grazing herbaceous vegetative height would be shortest under alternative A since livestock use of riparian and upland habitats is limited only by permitted seasons of use and numbers. Livestock use begins earliest under this alternative that allows sagebrush habitats to be grazed during the latter portion of the sage grouse nesting and during the brooding season. Approximately eleven miles of existing fence would continue to create barriers to wildlife passage; however the total miles of fence in this alternative would be approximately the same as in alternative C and D.

The amount of forage available for livestock consumption would be greater under this alternative than any of the other alternatives. The permittee wouldn't be required to apply new management nor would the permittee be required to construct any new projects.

2.6.2 Alternative B: No Grazing on the Bear Creek allotments

Alternative B does not authorize continued grazing on the affected allotments. Because of this, it is not able to provide opportunities for use of forage by domestic livestock.

Riparian areas would receive fewer grazing impacts than other alternatives, as total grazing impacts would be limited to wildlife species and recreational livestock. As such, riparian areas that are not in properly functioning condition would recover faster than in all other alternatives analyzed.

Alternative B best protects westslope cutthroat trout habitat at levels to maintain the integrity of existing populations. This is because it eliminates adverse impacts to stream banks and streamside vegetation from domestic livestock grazing. Grazing impacts are limited to wildlife species, and minor amounts of recreational livestock use.

Sagebrush habitats are the least affected by grazing, as removal of domestic livestock grazing limits impacts to wildlife species, and minor amounts of recreational livestock use. Removal of all interior fences under this alternative would provide the least opportunity for wildlife collisions and entanglement.

This alternative wouldn't provide for any livestock grazing since the Forest and BLM grazing leases would eventually be retired with the lapse of the current permit period. The permittee would be required to find alternative sources of forage or reduce herd numbers proportionally. The BLM would incur the costs of any fence modifications and/or project removals.

2.6.3 Alternative C: Manage Livestock Grazing with Allowable Use Levels

Alternative C allows grazing under the application of site-specific, riparian and upland allowable use levels to manage riparian and sagebrush habitats. It provides opportunities for use of forage by domestic livestock, while offering protection to other resources.

Site-specific allowable use levels are based upon potential vegetation, stream type, stream function, current vegetation conditions, and desired vegetation condition. As such, riparian areas that are not in properly functioning condition would recover faster than in Alternative A, but slower than with no grazing at all. Upland vegetation condition is maintained in good to improving condition using forage utilization levels.

Alternative C would protect westslope cutthroat trout habitat at levels to maintain the integrity of existing populations. Specific allowable use levels for controlling disturbance to stream banks are designated, and these would provide greater protection than Alternative A, but less protection than no livestock grazing at all.

A later livestock turn-out on nesting and brood rearing habitat, and application of allowable use levels for riparian and wet meadow habitats would provide for sage grouse habitat better than Alternative A. However, grazing impacts to sagebrush habitats would be greater than those in Alternative B where additional impacts from permitted livestock grazing would be eliminated.

If all optional range improvements were constructed, this alternative would have the most fences across sagebrush habitats. Modification of existing fences and construction of any new fences to BLM wildlife specifications would partially mitigate potential wildlife conflicts.
The amount of livestock grazing provided by this alternative would be greater under this alternative than under Alternative B or D, but less than expected under Alternative A.

Total livestock numbers are expected to remain constant however grazing would begin later than in Alternative A and potentially could end sooner if allowable use levels are met prior to the scheduled off-date. Costs associated with the management of livestock on the allotments are expected to increase due to the required monitoring of the various allowable use levels and movement of livestock as specified use levels are met. Management costs are expected to be greater than those associated with Alternatives A & B, but similar to those associated with Alternative D. If any fences are rebuilt, or if any of the other range improvements are constructed the BLM (or Forest, if applicable) would provide the materials and the permittee would provide the labor. BLM would incur the costs of any fence modifications.

2.6.4 Alternative D: Extended Rest in the Simpson Creek and Indian Creek Pastures; Manage Livestock Grazing with Allowable Use Levels on all other units.

Alternative D is essentially a combination of Alternatives B and C. The sagebrush, aquatic, riparian and wetland habitats associated with Indian, Brians and upper Simpson Creeks would be afforded the same protection as they would under alternative B. Functional-at risk stream reaches in the extended rest area would recover quicker than those on the grazed portions of the allotments. The remaining habitats would be grazed under the same site-specific allowable use levels defined for Alternative C, which would protect riparian and sagebrush habitats, while providing for livestock grazing.
Alternative D would protect westslope cutthroat trout habitat in Simpson and Brians Creek as well as Alternative B and would protect habitat in Cabin Creek as well as Alternative C. Non-cutthroat fisheries and other riparian and sagebrush habitats would receive the same protection and management as under Alternative C. The amount of livestock grazing provided by this alternative would be greater under this alternative than that of Alternative B, but less

than expected under Alternatives A or C. Increased management required for monitoring allowable use levels and movement of livestock would make costs similar to, but somewhat less than alternative C since livestock would be excluded from a portion of the Indian Creek allotment.

Table 2-3: Comparison of Effects, by Alternative, in the Bear Creek Allotments.

Issue Indicator	Alternative A	Alternative B	Alternative C	Alternative D
Streambank Alteration (end of season)	≥45%	0 - 5%	20 – 30%	0 – 30%
Herbaceous Vegetation Height (end of season)	0 – 6”	12” – 20+”	4” – 7”	4” – 20+”
Total Fence / Barrier Fence * (miles)	42 / 11	35 / 0	43 / 0	42 / 0
Earliest Begin Grazing Date	May 1	N/A	June 15	June 15
Expected Forage Harvest from BLM (AUMs**)	1700	0	1575	1325
Anticipated Livestock Management Costs	Moderate	Low - None	High	High
Permittee’s Annual AUM Replacement Cost	$633.00	$23, 532.00	$2317.00	$5684.00

* Barrier fences are typically constructed with woven wire &/or multi-strands of barbed wire. For the purposes of this analysis, fences with the bottom wire closer than 16 inches to the ground or with a top wire higher than 42 inches from the ground are considered barrier fences.

** An AUM or Animal Unit Month is a standardized measurement of the amount of forage necessary for the sustenance of one cow unit or its equivalent for 1 month. It is approximately equal to 800 pounds of forage. The AUM values shown in the table are estimates of expected forage harvest during “normal” years, with intensive livestock management. During periods of drought or with little riding and herding, these values may be considerably less.

*** AUM replacement costs are based on the current rate of $14.90 (minus $1.43 that would have been paid in BLM grazing fees) calculated for reductions from the 1747 AUM’s of grazing preference currently recognized for the combined allotments.

2.7 Identification of the Preferred Alternative

Alternative C: “Manage Livestock Grazing with Allowable Use Levels” is the preferred alternative. However, this is not the final decision. The Decision will be made after review of public comments on this EA.

CHAPTER 3.0 AFFECTED ENVIRONMENT

3.1 Introduction and General Setting

This chapter describes the existing condition of specific environmental components that may be affected by the proposed action. The description of the affected environment includes resource areas that are related to the Issues identified in Chapter 1.

The Bear Creek allotments lie on BLM, National Forest, and private lands in tributaries of the Big Sheep Creek drainage on the eastern slopes of the Rocky Mountains, and lie about 15 - 20 miles southwest of Lima, Montana. Elevations Range from 7000 to 9000 feet and slope south, southeast. The affected allotments lie in: T14S, R10 - 12W and T15S, R11W P.M.M. Appendix A displays vicinity and local maps of the allotments. The Bear Creek Allotments encompass about 9150 total acres. A breakdown of ownership and active grazing preference associated with each allotment is presented in Table 3-1. Livestock numbers and seasons of use are shown under the No-Action Alternative (2.5.1)

Table 3-1. Ownership & Grazing Preference by Allotment

Allotment Name & Number	Preference (AUMs)	Ownership (approx. acres)		
		BLM	Forest	Private
Crystal Creek #30102	342	1345	870	640
Junction #20009	670	2470	--	160
Cabin Creek # 20704	60	175	--	160
Indian Creek # 10741	509	2320	--	130
Indian Creek Isolated #30652	126	730	--	--
Meadow Creek Isolated #30611	40	160	--	--
Totals	1747	7200	870	1090

3.1.1 Special Designations or Special Features

The Bear Creek allotments are within the Yellowstone Nonessential Experimental Wolf Population Area. The Big Sheep/Medicine Lodge backcountry byway passes through all of the Bear Creek allotments except for the Meadow Creek Isolated allotment and the Continental Divide National Scenic Trail passes just above the Indian Creek allotment.

3.2 Description of Relevant Affected Resources

3.2.1 Riparian/Wetland Health & Function (Issue #1)

3.2.1.1 Streams

Bear Creek Ranches are located in the upper Big Sheep Creek Watershed, sub drainage of the Red Rock River Watershed. The Red Rock River joins the Horse Prairie Creek at Clark Canyon Dam to form the Beaverhead and the Beaverhead joins the Big Hole near Twin Bridges to form the Jefferson. Upper Big Sheep Creek Watershed drains approximately 109,000 acres. There are at least 17 perennial streams in the upper basin. Most are small

streams with late summer flows of 1 to 5 cubic feet per second. The USGS operated a gauging station located west of Dell, which measured drainage from the entire Big Sheep Watershed. The average annual discharge for 1978 was 47,310 acre-feet per year. The two watersheds in the analysis area are the Cabin Creek watershed, which drains approximately 26,170 acres, and the Meadow Creek Watershed, which drains approximately 27, 275 acres. Streams and springs within the Bear Creek Ranches in the Cabin Creek watershed are Hewlett Spring, Indian Creek, Sawlog Creek and Cabin Creek. Brian Creek, Simpson Creek, Alkali Creek and Tex Creek are located in the Meadow Creek Watershed.

3.2.1.2 Streamflow

Streamflow in Southwest Montana is related to geology, climate, precipitation, soils, vegetation, and human manipulation of the environment. Flow diversions for irrigation de-waters streams. Adequate streamflows are needed to maintain channel form and function for aquatic and terrestrial habitat.

3.2.1.3 Riparian & Wetland Habitat

Booth, geyer, and bebb willows dominate the woody canopy along Simpson, Brians, Indian and Sawlog Creeks. Very little willow regeneration is evident being limited primarily by large ungulate browsing. While the majority of these creeks type to a geyer willow/beaked sedge habitat type, Kentucky bluegrass and other disturbance species dominate much of the herbaceous understory vegetation.

A large beaver pond complex and associated wetland is located about mid-reach on upper Simpson Creek (stream reach TE21). Numerous livestock "crossings" are evident along this stream reach. Very little vegetation exists on the streambanks at these crossings and the stream channel has been significantly over-widened through past and present livestock trailing and trampling. The current level and duration of livestock use is perpetuating the existing degraded conditions at the crossings.

Brians Creek is a spring creek that surfaces roughly in the middle of the Simpson Creek Pasture. It is most likely "fed" or recharged from Morrison Lake and other pothole wetlands upslope on the Forest. Extensive streambank trampling, and soil compaction are evident along the entire length of Brians Creek. Based on the soil pedicles (over 12 inches in some cases) observed under and around several willow and shrubby cinquefoil plants it appears that significant soil compaction has occurred due to livestock trampling. Most of the mature willows along Brians Creek exhibit the "mushroom shape" silhouette or profile common to shrubs that have been heavily browsed by livestock. Mechanical damage to several willows due to cattle physically rubbing against the plant is also evident along this stream reach.

The Brians meadow wetland types to a shrubby cinquefoil/tufted hairgrass plant association, however booth, geyer and short-fruited willow are also present in this wetland. All short-fruited willow plants present display the low, compact hemisphere growth form typical for this species when heavily browsed.

Lower elevation riparian and wetland habitats out in Sheep Creek basin are dominated by Baltic rush, tufted hairgrass and shrubby cinquefoil. Isolated patches of booth, geyer, planeleaf, bebb and short-fruited willow are present along Tex and Cabin Creeks. Baltic rush-clustered field sedge herbaceous communities dominate riparian habitat along Alkali and Meadow Creeks. Beaked sedge is present in some areas where sufficient soil moisture is present and the site is stable. Wet meadow areas adjoining the stream typically receive heavy livestock use. Herbaceous vegetation is dominated by disturbance species in these areas and livestock trampling is plenteous in the more accessible areas such as old cut banks and alkaline seeps.

The riparian complex along Tex Creek and the several tributaries in the middle of the pasture receives substantially less livestock grazing due to normally wet conditions. The herbaceous community sustains more native species, and “streambank” trampling is very localized even though there is a great deal of frost (or abnormal hydrologic) heaving in the area. Lighter livestock use in recent years has allowed vegetation to establish on many of the older hummocks. Willows are found along both distinct channels and around seeps. Planeleaf, and short-fruited willow typically are found in very wet sites indicating that these sites are generally inaccessible to livestock, and adjacent shrubby cinquefoil appears to be flooding out. These sites appear to be sustained by irrigation return/spring flows. Winter browsing, mostly by moose, on the smaller stature plants is dependent on snow depth. Sufficient willow canopy is present on a portion of the Tex Creek drainage to type to short-fruited willow/beaked sedge/water sedge plant association. The lower Simpson Creek drainage/wetland complex is similar to Tex Creek without the willow canopy. This drainage represents a somewhat drier habitat type dominated by a shrubby cinquefoil/tufted hairgrass plant association.

Sedge composition appears to be increasing on the greenline along Cabin Creek. The minor willow canopy and distribution has not changed. Sedges are gradually stabilizing streambanks and trapping sediments, but past overuse is still obvious in hummocked banks, an over-widened stream channel and a high percentage of upland and disturbance-induced herbaceous species on the floodplain.

Seasonally and temporarily flooded alkaline fens, marshes and meadows support some unique and rare plant communities including short-fruited willow / water sedge and shrubby cinquefoil/sheep cinquefoil, which to date, is known only from Big Sheep Creek basin. A black greasewood / basin wildrye type borders the Tex Meadow wetland.

Alkaline meadows and other riparian habitats on the Bear Creek allotments support three BLM designated sensitive plant species, Idaho Sedge (*Carex parryana ssp. idahoa*), Rocky Mountain Dandelion (*Taraxacum eriophorum*), and Alpine Meadowrue (*Thalictrum alpinum*). All three species are palatable and are susceptible to excessive livestock grazing.

Alkali primrose (*Primula alcalina*) which also inhabits alkaline meadows, was recently discovered on BLM lands in the study area. Alkali primrose was previously thought to be extinct in Montana and was known only from east-central Idaho. Also known as Idaho primrose*, Primula alcalina* has a global rank of G 1, which means it's critically imperiled

because of extreme rarity &/or other factors making it highly vulnerable to extinction. Alkali primrose plants occur on low, relatively level benches immediately adjacent to creeks and spring heads, often on the inside of meander loops, and also on low benches with hummocky topography, where they are found only on the tops and sides the hummocks. While P. alcalina occurs on creek margins, the habitat is relatively stable hydrologically, as the creeks are entirely spring-fed and generally are subject to only minor seasonal or annual fluctuations in flow. *Primula alcalina* populations appear to tolerate a fairly broad range of livestock grazing regimes. In Idaho, it has coexisted with livestock for many years at some sites, and has persisted in areas excluded from livestock as well.

3.2.1.4 Riparian and Wetland Functioning Condition

There are approximately 14 miles of BLM riparian habitat and approximately 400 acres of Palustrine emergent persistent and shrub-scrub wetlands on BLM lands within the Bear Creek allotments. (Palustrine wetlands are non-tidal wetlands dominated by trees, shrubs, emergents, mosses or lichens. Emergent persistent wetlands are dominated by herbaceous vegetation that normally remains standing at least until the next growing season while shrub-scrub wetlands are dominated by woody vegetation less than 20 feet tall.) Less than one mile of riparian habitat and one acre of wetland habitat is in proper functioning condition. Nearly 13 miles of riparian habitat and over 400 acres of wetland habitat are functional-at risk. Only .4 mile of riparian habitat is nonfunctional. The causes of impairment include physical and biological impacts, generally related to grazing management. Physical indicators of at risk or nonfunctional riparian and wetland habitats include livestock trampling and hoof action that has contributed to compacted soils, exacerbated abnormal hydrologic heaving (formation of hummocks,) altered and unstable streambanks and widened stream channels. Biological indicators include the presence of shallow-rooted plants, upland plant species and introduced and evasive herbaceous plant species such as Kentucky bluegrass, dandelion and redtop in the riparian and wetland habitats. Limited structural and age class diversity of willows along some stream reaches is another biological indicator of at-risk riparian areas.

In addition, many of the streams, are dry for some portion of the year. A common method of irrigation in Big Sheep Creek basin is damming the creeks, in which case the stream is dewatered downstream.

Riparian functioning condition and trend is summarized in Table 3-2 by stream reach. Wetland functioning condition and trend is summarized in Table 3-3. A map showing individual stream reach and wetland locations is presented in Appendix D. Complete riparian and wetland inventories, condition and trend information is maintained in individual stream files at the Dillon field Office. Additional site-specific riparian data collected by the Montanan Riparian and Wetland Research Program is available on-line at Bitterroot Restoration Inc.'s website.

Table 3-2. Riparian Condition

Stream / Reach Nu	Existing Vegetative Community	Length (miles)	Functioning Condition -Tren
Sawlog / TE16	Geyer Willow / Beaked Sedge	0.9	Functional At Risk - Static
Simpson / TE19	Geyer Willow / Beaked Sedge	0.3	Functional At Risk - Down

Simpson / TE21	Geyer Willow / Beaked Sedge	1.0	Functional At Risk - Static
Indian / TE20	Geyer Willow / Beaked Sedge	0.7	Proper Functioning Condition
Indian Trib. / TE236	Geyer Willow / Beaked Sedge	0.5	Functional At Risk - Up
Brians / TE183	Geyer Willow / Beaked Sedge	0.9	Functional At Risk - Static
Cabin / TE167	Shrubby Cinquefoil / Tufted Hairgrass	0.4	Functional At Risk - Up
Cabin / TE169	Shrubby Cinquefoil / Tufted Hairgrass	0.3	Functional At Risk - Up
Cabin / TE170	Shrubby Cinquefoil / Tufted Hairgrass	1.0	Functional At Risk - Static
Simpson / TE173	Beaked Sedge Herbaceous Vegetation	1.1	Functional At Risk - Static
Tex / TE174	Beaked Sedge Herbaceous Vegetation	1.0	Functional At Risk - Static
Cabin / TE68	Shrubby Cinquefoil / Tufted Hairgrass	1.0	Functional At Risk - Up
Hewlett / TE193	Shrubby Cinquefoil / Tufted Hairgrass	0.4	Nonfunctional
Porcupine / TE227	Shrubby Cinquefoil / Tufted Hairgrass	0.5	Functional At Risk - Static
Alkali / TE224	Baltic Rush / Clustered Field Sedge	1.4	Functional At Risk - Static
Alkali / TE235	Baltic Rush / Clustered Field Sedge	1.0	Functional At Risk - Static
Meadow / TE45	Baltic Rush / Clustered Field Sedge	0.4	Functional At Risk - Down
Tex Trib. / TE225	Baltic Rush / Clustered Field Sedge	1.0	Functional At Risk - Static

Table 3-3. Wetland Condition

Wetland / Number	Existing Vegetative Community	Area (acres)	Functioning Condition -Trend
Tex Meadow / TE226	Baltic Rush / Clustered Field Sedge	350	Functional At Risk - Static
Brians Meadow/ TE234	Shrubby Cinquefoil / Tufted Hairgrass	50	Functional At Risk - Static
Brians Pothole 1 / TE244	Shrubby Cinquefoil / Tufted Hairgrass	1	Functional At Risk - Static
Brians Pothole 2 / TE245	Shrubby Cinquefoil / Tufted Hairgrass	4	Functional At Risk - Static
Brians Pothole 3 / TE246	Shrubby Cinquefoil / Tufted Hairgrass	1	Functional At Risk - Static
Brians Pothole 4 / TE247	Shrubby Cinquefoil / Tufted Hairgrass	1	Functional At Risk - Static
Simpson Puddles/TE237	Baltic Rush / Herbaceous Vegetation	1	Proper Functioning Condition

3.2.1.5 Riparian Dependant Wildlife

Moose frequent the willow dominated riparian communities on the Bear Creek allotments, as do at least 30 different species of neotropical migrant songbirds. Sage grouse depend on riparian habitats for nesting and brood rearing. Mink and water shrews are present along the perennial stream reaches on the allotments. Several species of puddle ducks have been observed on or near streams during the breeding and nesting seasons.

As of 2001, there were no active beaver colonies on the Bear Creek allotments, which represents a missing habitat component. An old beaver dam is located along stream reach TE21 on Simpson Creek and there is evidence of recent beaver activity upstream on Simpson Creek above the Forest boundary. Beavers have declined significantly region-wide, and the only large beaver complexes remaining in Big Sheep Basin are in Nicholia Creek, Tex Creek and Simpson Creek. These areas can provide beaver recruitment into adjoining watersheds but suitable habitat to sustain beaver colonies is generally lacking. Consequently, current beaver occupancy is short term and intermittent. Beaver activity removes large woody material to create dams and food, but they often disappear within a few years before dams can stabilize. Any willow or aspen recruitment that is stimulated by beaver activity is subsequently affected by livestock and wildlife browsing, which ultimately leads to a loss of riparian woody vegetation. Without suitable riparian habitat and stable beaver populations throughout a watershed, it is unlikely that beavers can play their historic keystone role of riparian habitat creation and enhancement. Managing livestock impacts to enhance woody riparian communities would support potential beaver recovery in the Big Sheep Creek watershed.

Existing vegetation does not provide occupied lynx habitat on the Bear Creek allotments, but riparian stringers may serve as travel corridors between potential habitat in the Tendoy Mountains and along the Continental Divide.

3.2.1.6 Water Quality

The Water Quality Assessment for the streams located within the Bear Creek Ranches Management Plan Area is based upon guidance provided by the:

- Clean Water Act, as amended
- Montana Water Quality Act
- Bureau of Land Management riparian area procedures for assessing proper functioning condition
- Knowledge gained in working with Montana DEQ and local watershed committees.

The Clean Water Act, as passed by Congress, seeks to restore and maintain the chemical, physical and biological integrity of the Nation's waters and to provide for protection and propagation of fish, shellfish, and wildlife. The Act further provides for recreation in and on the water. While the responsibility for the implementation of the Clean Water Act and beneficial use assessment, rests with individual States, Federal Agencies are directed to work with States in implementation and assessment. The Environmental Protection Agency (EPA) has delegated implementation of the Clean Water Act and the restoration of Beneficial Uses to Montana Department of Environmental Quality (DEQ). The State of Montana is in the process of assessing its streams. Many streams have not been assessed altogether or the assessments are over 20 years old. Water Quality Restoration Plans must be developed for all Montana Watersheds where beneficial uses aren't being attained.

The streams in the Bear Creek Ranches Management Plan area are also located within DEQ's Lower Red Rock Watershed Planning Area. Montana has until 2007 to develop a Water Quality Restoration Plan for the Lower Red Rock Watershed.

Beneficial Use Protection and Non-degradation Provisions

Beneficial use protection and protection from degradation are key elements of the Clean Water Act and the Montana Water Quality Act. Streams provide beneficial use when they support fish propagation, recreation, and are drinkable after conventional treatment. Streams can be degraded through physical, chemical or biological impairment. Stream channel geometry is associated with its ability to transport sediments, keep water cool, and provide habitat. Assessments of physical, chemical, and biological characteristics, in combination, are utilized in stream/water quality assessments. Water quality indicators include the use of aquatic species, land condition, stream channel condition, presence of stream buffers and their condition, and existence, composition and condition of riparian vegetation.

The State of Montana's Department of Environmental Quality is responsible for making Beneficial Use Support determinations through a formal process known as Sufficient and Credible Data. The Bureau of Land Management does not make Beneficial Use determinations. There are parallels between DEQ's use of Sufficient and Credible Data and the Bureau of Land Managements Process for Assessing Proper Functioning Condition. Some of these parallels include assessment of physical characteristics of the stream channel and floodplain and the use of biological indicators.

No comprehensive aquatic biotic monitoring data are available for the Bear Creek Ranches Management Plan Area. Limited chemical and biotic data, which included macro invertebrate data, was collected in support of cutthroat trout studies. More weight is given to macro invertebrate samples than chemical samples. Aquatic macro invertebrates are valuable indicators of water quality evaluations because they live near, in or on streambed sediments, have relatively long life cycles and cannot evade pollution events in contrast to fish. Interpretation of type and number of species is useful in understanding nutrient enrichment, high sediment loads, low dissolved oxygen and thermal impacts.

Aquatic benthic macro invertebrate monitoring samples taken from riffles on Cabin Creek in 1995 and 1998, Sawlog Creek in 1994, Simpson Creek in 1997, and Brians Creek in 1999 were sent to the National Aquatic Ecosystem Laboratory at Utah State University for analyses and interpretation relative to water quality. Most data measures correlated with the riparian functional assessments shown elsewhere in this document.

Riparian and wetland functioning condition, discussed above in Section 3.2.1.4 are made through an evaluation of hydrology, vegetation, and erosion/sedimentation. All reaches of Indian Creek are in Proper Functioning Condition. Alkali, Brians, Cabin, Meadow, Porcupine, Sawlog, Simpson, and Tex Creek are Functioning at Risk with varying trends. The lower Hewlett Spring drainage (TE193) is nonfunctional

3.2.2 Westslope Cutthroat Trout Habitat (Issue # 2)

Most of the landforms in the management area are dissected by stream courses. Perennial and intermittent stream density in the area is high. The fisheries are characterized by cold-water salmonids and mottled sculpins. The main drainage, Big Sheep Creek supports

populations of eastern brook, brown and rainbow trout. There are approximately 7 miles of fish-bearing waters within the Management Plan area; Indian Creek, Unnamed Tributary (commonly called Brians Creek), Simpson Creek, Meadow Creek and Cabin Creek. Most streams within the watershed are probable historic westslope cutthroat trout (WCT) habitat. Presently, Cabin Creek and the upper portions of Simpson and Meadow Creeks support populations of WCT.

Simpson Creek and Meadow Creek support populations of 100% pure westslope cutthroat trout within the upper Big Sheep watershed. Since Brian's Creek is an upper tributary, it is logical to suspect that it is also 100% pure WCT. Cabin Creek, also in the upper Big Sheep Creek basin, supports a population of 98% pure WCT. Westslope cutthroat trout habitat is displayed on the map in Appendix E. Brian's Creek potentially has a 100% pure strain of WCT and will be managed as such pending results of genetic testing.

The westslope cutthroat trout (WCT), *Oncorhychus clarki lewisi,* is designated on the Bureau of Land Management's Species of Special Concern list. The limited distribution of WCT in the management area is representative of other areas throughout the upper Missouri River Drainage in Montana. In light of this, the westslope had been petitioned for listing under the Endangered Species Act with a "not warranted" finding. A Memorandum of Understanding and Conservation Agreement for WCT has been developed by resource agencies, conservation and industry organizations, resource users, and private land owners to expedite the implementation of conservation measures for westslope cutthroat trout in Montana. All land uses must address their affect on the habitat of the fish in the management plan. Westslope Cutthroat Trout on public lands currently reside in less than 2% of their historic range and as such have been given priority for inventory on public lands.

The goal of the Memorandum of Understanding and Conservation Agreement is to ensure the long-term, self-sustaining persistence of westslope cutthroat trout within each of the five major river drainages they historically inhabited in Montana (Clark Fork, Kootenai, Flathead, upper Missouri, and Saskatchewan). The BLM is working cooperatively with Montana Fish, Wildlife and Parks, the U.S. Forest Service, and U.S. Fish and Wildlife Service to develop a conservation plan for cutthroat in the upper Missouri River drainage, which includes this management area.

Livestock have been grazing the management area for over 100 years. Effects of livestock grazing include changes in vegetative structure, composition, stream channel alteration, and hummocking of wet soils.

The U.S. Bureau of Fisheries first introduced rainbow, brown and brook trout into Montana in 1889. Over the next 70 years, they were stocked in nearly every stream and lake that appeared capable of supporting a fishery, including the creeks in the management area. While Montana Fish, Wildlife and Parks no longer stocks most streams, these non-native trout species occupy the vast majority of southwest Montana's streams, and comprise the species most often sought after by anglers.

Changing social values have altered how many people view the success of past fish stocking programs. Brook trout's competitive advantage and rainbow's tendency to hybridize with cutthroat have eliminated the purebred westslope cutthroat trout from many streams. Where westslope cutthroat persist, they remain isolated, often in short headwater stream segments. Native species have acquired considerable value (and management attention) even though they don't always provide the angling opportunities comparable to the introduced species.

Habitat is the most basic requirement for attaining or maintaining healthy fish populations. Viable, stable populations require abundant, high quality and diverse habitats that satisfy requirements for all life stages. The most significant effects on fisheries from land management activities are indirect and cumulative. Land management may alter the physical, thermal or chemical properties of streams. Stream properties define fish habitat condition. Thus, habitat is vulnerable to activities that alter the stream. Fish and other aquatic species are directly and/or indirectly affected when there are changes in the quality and/or abundance of their habitat The capacity of riparian areas to provide important habitat for many species and their relationship with stream channel stability have become more broadly recognized over the last two decades. Proper riparian function will meet most habitat objectives for fish. In several streams, degradation has decreased habitat diversity and complexity necessary to support strong populations or mitigate effects from extreme temperatures, fires, floods or other natural events. Healthy riparian areas require maintenance of certain aspects of the vegetative community and stream channel shape. Livestock grazing can influence both of these and has affected certain riparian areas within the management area.

Lower Meadow Creek, Simpson Creek and Cabin Creek exhibit high levels of embeddedness, which is a measure of sedimentation. When embeddedness exceeds 20%, survivability of eggs is greatly reduced. BLM fishery biologists determined that all of these creeks have average embeddedness levels in excess of 50%. Livestock grazing, fish stocking, channelization, riparian management and sediment introduction have all negatively influenced streams and fisheries within the management area.

3.2.3 Sagebrush Habitats and Sagebrush Dependent Species (Issue # 3)

Historic land use practices in Big Sheep Creek basin included attempts by the BLM and Forest Service to increase forage. Portions of the Junction allotment, primarily Wyoming big sagebrush types, were plowed and seeded to introduced grasses and yellow sweet clover in 1962. The plowed areas have pretty much reverted back to native plant species with a few isolated Siberian wheatgrass plants providing the only remaining evidence of the seeding. Sagebrush was sprayed on the Forest portion of the Crystal Creek allotment in 1974, resulting in an estimated 30% sagebrush kill. No discernable differences in sagebrush canopy in the sprayed and unsprayed areas were noted during recent field inspections.

Habitats on the Bear Creek allotments currently support three subspecies of big sagebrush, two subspecies of low sagebrush, three-tip and silver sagebrush. The highest elevations are dominated by mountain big sagebrush/Idaho fescue habitats, while the mountain big sagebrush/bluebunch wheatgrass type being common on steep south facing slopes. Less common is the three-tip sagebrush/Idaho fescue community type, which generally occupies a

drier site than the mountain big sagebrush/Idaho fescue plant community. Since fire kills big sagebrush and three-tip sage re-sprouts after a fire, fire history may play a role in determining the distribution of these two plant communities across the landscape.

Wyoming and mountain big sagebrush, low and early low sagebrush habitats occupy much of the sheep creek basin floor. While relatively common in the Great Basin, steppe dominated by low and early low sagebrush community types is found in Montana only in southern Beaverhead County. Common grasses associated with these sage types include thick-spike wheatgrass, Sandberg bluegrass, prairie junegrass, plains reedgrass and Idaho fescue.

Silver sagebrush and basin big sagebrush are primarily confined to riparian areas, intermittent drainages and adjacent terraces. Basin wildrye and green needlegrass, which decrease under grazing, make up a minor component of the understory vegetation in these types. More common are grasses that increase under grazing pressure such as western wheatgrass and Kentucky bluegrass. One notable exception is in the Indian Creek bottom where basin wildrye has increased dramatically in response to nearly ten years of rest from livestock grazing. Basin wildrye is considered excellent cover habitat for small animals and birds, excellent nesting cover for upland birds, and excellent standing winter feed and cover for big game animals.

The low sagebrush, mountain big sagebrush, and Wyoming big sagebrush habitats in Big Sheep Creek basin winter approximately 350 pronghorn antelope and provide year-round habitat for pygmy rabbits. While the Bear Creek allotments provide year-round habitat for antelope, only fifteen to twenty percent of the antelope winter habitat occurs on these allotments. The map in Appendix E shows yearlong antelope habitat. The mountain big sagebrush communities on south and west facing slopes of the Crystal Creek and Indian Creek allotments provide winter habitat for up to 100 elk during years of lighter snowfall.

While the two leks located in Big Sheep Creek basin are not located on the Bear Creek allotments, they roughly coincide with the center of sage grouse breeding habitat for an estimated 200 birds. Breeding habitat, which is defined as those areas used for breeding, nesting and early brood rearing (generally areas used by chicks until they are 5 to 7 weeks of age) is displayed as a 3-mile buffer around the leks shown on the map in Appendix E. The sage grouse nesting and brood rearing season run from approximately May 1 through July 15 in Big Sheep Creek basin. Portions of the Sheep Creek basin sage grouse population are reputed to winter in Idaho, while others spend the entire year within the boundaries of the Big Sheep Creek watershed. Radio telemetry studies and field observations confirm that sage grouse frequent all of the sagebrush habitats on the Bear Creek allotments.

From a management perspective, the sagebrush habitats with an understory of tall bunchgrasses such as bluebunch wheatgrass, green needlegrass and basin wildrye provide very good sage grouse breeding habitat. Sagebrush habitats with an understory of shorter bunchgrasses such as Idaho fescue, Sandberg bluegrass, prairie junegrass may not meet the needs of sage grouse for nesting and early brood rearing.

Other sage-dependent avian species that frequent the Bear Creek allotments include the sage thrasher, sage sparrow and Brewer's sparrow. Mule deer are regularly observed on the

allotments during the spring, summer and fall, primarily in the more rugged mountain big sagebrush habitats.

Chicken Sage (*Sphaeromeria agenta*) is a BLM designated sensitive plant species found in low sagebrush steppe habitats within Big Sheep Creek basin. While it is not palatable to cattle, it is found on shallow limestone soils along ridges and benches that are often selected for livestock salt or supplement placement.

3.2.4 Grazing Permittee's Economic Situation (Issue #4)

Presently Bear Creek Ranches supports approximately 520 cow/calf pairs on a year-round basis. The Bear Creek allotments cumulatively provide pasture for approximately 420 cow/calf pairs from mid-May through mid-late September. As noted in Table 3.1, private land base property constitutes less than 1100 acres or 12% of the total lands included in the Bear Creek allotments. Public lands within the allotments are important for maintaining livestock operations at current levels. Bear Creek Ranches is currently permitted to harvest 1939 AUMs from BLM lands annually. Of that, 1747 AUMs are allocated to the allotments addressed in this environmental assessment. (The additional 192 AUMs are allocated to the Meadow Creek allotment, which isn't covered under this analysis.) A breakdown of AUMs by allotment is presented in table 3-1.

Labor associated with managing cattle on the BLM allotments includes herding and doctoring cattle, supplement placement and project maintenance. Specific costs associated with the managing cattle on the individual BLM allotments are not known and probably vary substantially. The base property associated with these allotments is currently for sale.

3.3 Description of Relevant Non-Affected Resources

3.3.1 Climate and Precipitation

The climate in this region is typical intermountain semi-arid. Temperatures range from -50 degrees in winter to 100 degrees in summer. The area has a short growing season varying from 90 to 120 days. Precipitation ranges from 12 to 20 inches per year in valley bottoms and upwards of 50 inches in the mountains. Precipitation data from nearby Madison County indicate that there are two seasonal highs. The major precipitation period from November to March accounts for 60 percent of total precipitation. Spring storms, which occur during May and June, account for another 15 percent of annual precipitation. Approximately two thirds of mountain precipitation falls as snow.

3.3.2 Geologic Setting

The geology of the area is complex, consisting of sedimentary, igneous and metamorphic rock. Important to soils formation and topography, is the Madison limestone formation, which runs northwest to southeast across the basin. The geologic time spans pre-Cambrian to present. The Red Rock Fault is a dominant feature of the landscape resulting in the formation of the Tendoy Mountains. The fault, as well as the Tendoys themselves, trend northwest to

southeast. The Tendoys bound the area to the east, while the Beaverhead Mountains, part of the Bitterroot Range, form the western boundary.

3.3.3 Soils

Three soil types are mapped within the Dillon Resource Area Soil Survey, which was mapped on a broad scale in the late 1970's. Soils in the area reflect the combination of precipitation, weathering, growing season and geology. These soils are generally shallow, cold, rocky soils formed on uplands in sedimentary, igneous and metamorphic rock. The Bear Creek Ranches soils belong to the Great Group Cryoborolls, meaning dark, dry, cold, upland soil. Three Cryoborolls occur within the basin. Hydric soils, wet soils, occur in drainages and spring seeps within all three soil types. The three Cryoborolls are as follows:

- Typic: These soils occur at elevations ranging from 8000 to 9000 feet and are located in the westernmost portions of the study area as well as the higher elevations of Island Butte.
- Calcic: These soils have formed over the Madison limestone, occur below the Typic Cryoborolls and are the major soil type in the study area.
- Argic: The Argic Cryoborolls are clayey soils and are found in the northwest and southwest areas of the drainage basin.

The Mountain Foothills Grazing Management DEIS indicates that the soils within the study area are all moderately to severely susceptible to erosion. Upland health assessments done in 2000 indicated that erosion was not a problem, however localized soil conditions indicate there may be increased susceptibility to erosion and compaction.

3.3.4 Air Quality

According to Montana Department of Environmental Quality, air quality in Beaverhead and Madison counties is excellent. In the EPA Air Quality terminology, southwest Montana is in attainment; that is, the air resource meets or exceeds all National Ambient Air Quality Standards. The Clean Air Act describes two major air quality classes, Class I and Class II. Class I areas are areas where visibility is an important value. There are strict standards for such areas. Class I areas are generally national parks or wilderness areas. Red Rocks Lakes is one Class I area and is located in the Centennial Valley, south of the Dillon Field Office. Three other Class I areas are located in areas surrounding Beaverhead and Madison counties. These are: Yellowstone National Park, Selway-Bitterroot Wilderness and Anaconda Pintler Wilderness. Class II areas are the most common areas and describe areas covered under the Clean Air Act. With the exception of Red Rocks Lakes, Beaverhead and Madison County are both Class II. The Dillon Field Office does not operate air quality monitoring stations, nor does it have any operations which require air quality permits, therefore there are no site specific field office data or observations for making air quality determinations. The Dillon Field Office works in cooperation with the Montana/Idaho Smoke Management Group to comply with the Environmental Protection Agency’s 1998 Interim Air Quality Policy on Wildland and Prescribed Fires

3.3.5 Special Status Plant Species

In addition to the special status plants mentioned in section 3.2, one sensitive species Cusick's Horse-mint (*Agastache cusickii,*) and three BLM watch species Nuttall's Townsendia (*Townsendia nuttallii,*) Hoary Phacelia (*Phacelia incana*,) and Hutchinsia (*Hutchinsia procumbens*) are found on or in the vicinity of the Bear Creek allotments. All of these plants inhabit limestone outcrops, talus slopes or other habitats rarely visited by livestock.

3.3.6 Threatened Endangered and Sensitive Wildlife Species

The Big Sheep Creek watershed lies in the biological corridor between the central Idaho wildernesses and the greater Yellowstone ecosystem. With the reintroduction of wolves into both these areas, and the historical occurrence of resident wolves, it is increasingly likely that more wolves will be present in this area. The corridor's location within the watershed enhances the likelihood of wolves, grizzly bears, wolverine, lynx and other large predators at least occasionally occupying portions of the watershed. Grizzly bear sightings were reported both north and south of the Bear Creek allotments in September 1999. For more information, see Biological Evaluation, Appendix F.

3.3.7 Cultural Resources

In conjunction with the Mountain Foothills Grazing EIS in the late 1970s, a Class II cultural resources inventory was conducted for a 10% sample of lands within the Dillon Resource Area. At that time the Bear Creek Ranches Grazing Allotments were included within the Tendoy Planning Area. Results of the sample inventory indicated that cultural site densities in the Tendoy Planning Area were considerably **lower** than that observed in other planning areas, with the average site density of 1 site per 1.5 square miles.

An examination of existing records on file with the BLM-Dillon Resource Area, the Beaverhead National Forest, and the Montana State Historic Preservation Office, indicates that there has been only a very limited amount previous cultural resource inventory conducted within the Bear Creek Ranches grazing allotments. One inventory was conducted for a small range improvement project (water pipeline) and one inventory was conducted for a seismic exploration project. Both inventories were of very limited scope, involving an examination of only a couple of acres for each. In view of the limited amount of field inventory conducted, only one cultural resource has been formally identified or recorded within boundaries of the Bear Creek grazing allotments. Site 24BE414 was recorded as a small surface lithic scatter along both sides of Indian Creek in the Indian Creek Grazing Allotment. The site has NOT been formally evaluated for significance or eligibility to the National Register of Historic Places. An examination of the site form suggests that the site may have been adversely impacted by cattle grazing, recreational activity, and road construction. It is recommended that the site be revisited to determine if such adverse impacts continue to occur. It should also be noted that remnants of the old Corrine wagon road (between Corrine, Utah and Bannack, Montana) appear to traverse through the area. This wagon road was important in the 1860's and 1870's as an access route to the Montana goldfields. Intact portions of the wagon road, though known

to occur, have yet to be formally recorded or evaluated in the vicinity of the Bear Creek Ranches grazing allotments.

3.4 Conformance with the Standards of Rangeland Health

The Butte Resource Advisory Council established the following five standards for rangeland health as required by 43 CFR 4180.

- Standard #1: Uplands are in proper functioning condition.
- Standard #2: Riparian and wetland areas are in proper functioning condition.
- Standard #3: Water quality meets State standards.
- Standard #4: Air quality meets State standards.
- Standard #5: Provide habitat as necessary, to maintain a viable and diverse population of native plant and animal species, including special status species.

As part of this planning process the Bear Creek interdisciplinary team made recommendations on whether or not the existing grazing management in place on the Bear Creek allotments was in conformance with these standards. The Dillon Field Manager made the determinations, which only apply to BLM lands within the Bear Creek allotments, after reviewing the ID Team recommendations and information collected and compiled for Chapter 3 of this analysis. The riparian and water quality standards don't apply to the Meadow Creek Isolated allotment since it doesn't support any riparian or wetland habitats. A summary of the determinations is presented in Table 3-4.

Table 3-4. Conformance with Standards for Rangeland Health

Allotment Name & Number	Are the following standards being met OR is significant progress being made toward meeting the standard?					Is existing grazing management a significant factor in failing to achieve standards?
	#1 Uplands	#2 Riparian	#3 Water Quality	#4 Air Quality	#5 Habitat	
Crystal Creek #30102	YES	NO	NO	YES	NO	YES
Junction #20009	YES	NO	NO	YES	NO	YES
Cabin Creek # 20704	YES	NO	NO	YES	NO	YES
Indian Creek # 10741	YES	NO	NO	YES	NO	YES
Indian Creek Isolated #30652	YES	NO	NO	YES	NO	YES
Meadow Creek Isolated #30611	YES	N/A	N/A	YES	NO	YES

3.5 Cumulative Effects Boundary

The areas to be potentially impacted by revising livestock management in the subject allotments include the Big Sheep Creek and Medicine Lodge Creek watersheds in their entirety, the portion of the Horse Prairie Watershed that lies east and south of State Highway 324, and the portions of the Red Rock River and Junction Creek watersheds that lie west of U.S. Interstate 15. These areas coincide with the Tendoy Elk Management Unit described in the "Statewide Elk Management Plan for Montana", with the exception of the portion of Hunting District 328 that lies west of State Highway 324.

CHAPTER 4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Introduction

This chapter discloses the environmental consequences (impacts) of implementing the alternatives described in Chapter 2. The affected environment, outlined in Chapter 3, provides the context and baseline for describing the consequences. A summarized comparison of these consequences, by alternative, is presented at the end of Chapter 2.

Chapter 4 focuses on the important impacts, while other effects are described briefly. The environmental consequences are organized by resource. This chapter also discloses the cumulative, or combined, impacts of alternative actions with past, present and reasonably foreseeable actions.

4.2 Predicted Effects on Relevant Affected Resources of All Alternatives

4.2.1 Predicted Effects on Riparian/Wetland Health & Function (Issue #1)

Improper livestock management, through excessive grazing and trampling, can affect riparian/stream habitats by reducing or eliminating riparian vegetation, causing channel aggradation or degradation, causing widening or incisement of stream channels, changing streambank morphology and the lowering of the surrounding water table. The severity of livestock impacts on riparian health and function is related to the amount of time cows spend in the riparian area. More time spent relates to more opportunity for affecting the physical and biological components of the area that relate to function. In comparing the alternatives, those that include practices and guidelines specifically designed to mitigate an identified source or problem by effectively limiting the time livestock spend in the riparian area will be more effective in restoring or maintaining riparian function.

If an alternative is selected that reduces the amount of time livestock spend on public land, the potential exists for increasing grazing pressure on, and potentially damaging, adjacent and interspersed private riparian habitats and downstream water quality.

4.2.1.1 Effects of Alternative A: "Continue Livestock Grazing as Currently Authorized" on Issue #1

The No Action alternative would make only partial progress toward restoring riparian and wetland habitats to proper functioning condition. Indian Creek, which is in proper functioning condition, would remain so. Limited recovery is expected to occur on riparian habitats within the Crystal Creek allotment where the Beaverhead National Forest interim riparian standards are applied. Moving livestock when allowable greenline stubble heights are reached is expected to allow continued expansion of sedge communities along Cabin Creek. However the existing physical condition of the stream channels would remain relatively unchanged on Cabin Creek and all other streams due to continued streambank trampling by livestock. Field data collected by the Riparian and Wetland Research Program between 1992 and 1994

revealed grazing-induced bank alteration in excess of 60% on the majority of the stream reaches inventoried on the Bear Creek allotments.

With the exception of streams in the Crystal Creek allotment, all stream reaches that are presently functioning-at-risk could continue to receive the same level of use that led to the existing situation. These reaches would also continue to be susceptible to climatic events that could further affect their stability.

Little or no willow regeneration would be expected due to periodic browsing by livestock in late summer and early fall, in addition to wildlife browsing. Increased decadence and eventual reductions in willow canopy would be anticipated on Simpson, Brians and Sawlog Creeks. Heavy to extreme utilization levels of the herbaceous riparian species would favor introduced species such as redtop and Kentucky bluegrass over native grass and sedge species. Continued heavy use may move sites toward early seral or lower ecological status plant communities.

Riparian dependent wildlife would continue to compete with cattle for food, water, and space, especially on wet meadows and streamside habitats where livestock utilization levels have been documented to be in excess of 75% in previous years. Wildlife diversity and levels of use would decline as willow communities lose density and structure.

4.2.1.2 Effects of Alternative B: "No Grazing on the Bear Creek Allotments" on Issue #1

No grazing would result in elimination of all livestock-caused impacts on streambanks and riparian and wetland vegetation. The proper functioning riparian habitat associated with Indian Creek would be maintained while functional-at-risk and nonfunctional riparian areas would move toward Proper Functioning Condition faster than under any of the other alternatives.

Initially, the existing streamside vegetation would increase in both vigor and density. This vegetation would begin to trap sediments causing deposition and building stream banks. Concurrent with the deposition, the existing vegetation would become denser and more vigorous. Over time as ecological succession is allowed to proceed, changes in herbaceous species composition are expected with deep-rooted, riparian obligate species replacing shallow-rooted and introduced species. Willow regeneration would be restricted only by wildlife browsing which isn't expected to limit recruitment. As the vegetative component of riparian areas and wetlands continues to progress toward site potential, a corresponding improvement in the physical attributes of these area is also expected. Stream channels would narrow, floodplains would become more effective in reducing erosive energies within the channel, local water tables would rise, and sediment transport efficiency would increase. Riparian dependent wildlife habitat requirements would be optimized under this alternative, favoring those species requiring dense herbaceous vegetation and multi-level canopies.

4.2.1.3 Effects of Alternative C: "Manage Livestock Grazing with Allowable Use Levels" on Issue #1

Managing livestock grazing with allowable use levels would initiate progress toward restoring riparian and wetland habitats to proper functioning condition. The rate at which PFC is achieved is dependent upon the existing condition of the riparian and wetland habitat. Riparian habitat restoration would be similar to that described under Alternative B, but at a slower rate.

Maintaining a minimum stubble height of 4" and limiting annual utilization of palatable herbaceous species in riparian habitats to 50% is expected to maintain the existing riparian plant communities and encourage Baltic rush and/or sedge communities to expand along affected stream reaches. This in turn will provide additional protection and stability to streambanks. Limiting livestock utilization on wetlands to 40% and providing periodic rest should allow associated sensitive plant species to produce and disperse seed at an intervals adequate to ensure their continued persistence.

Moving livestock from riparian habitats when they begin to show a preference for woody species would reduce willow browsing and mechanical damage of willows. This is expected to initiate a gradual increase in willow canopy along Simpson, Brians and Sawlog Creeks. While some competition would continue between wildlife and livestock for the use of riparian habitats, moving livestock from riparian and wetland areas based on allowable use levels should adequately provide for riparian dependent species, especially on functional-at risk reaches.

4.2.1.4 Effects of Alternative D: "Extended Rest in the Simpson Creek and Indian Creek Pastures; Manage Livestock Grazing with Allowable Use Levels on all other units" on Issue #1

Alternative D is essentially a combination of Alternatives B and C. The riparian habitat associated with Indian Creek would remain in proper functioning condition while recovery of riparian habitat along Brians and upper Simpson Creeks would progress as outlined under alternative B. By eliminating livestock trampling and compaction on the Brians meadow wetland, it is expected to quickly recover to proper functioning condition. Removing cattle from Sawlog Creek when they begin to browse on willows would allow for maintenance of the existing willow canopy. Willow recruitment would be limited only by wildlife browsing. Other impacts would be similar to those described for Alternative C.

4.2.2 Predicted Effects on Westslope Cutthroat Habitat (Issue #2)

Grazing density and duration affects fish health and mortality indirectly through habitat modification. There are no direct effects from grazing to the fisheries resource from any of the proposed alternatives.

Dewatering for irrigation and habitat modification by previous grazing practices have the most negative effects on fisheries habitat on the Bear Creek allotments. Streambank alteration through trampling, reduction of streambank vegetation, increasing water temperature, increased sedimentation and lowering of the surrounding water table are some of the indirect effects that grazing can have on the fisheries resource. The intensity and duration of livestock grazing is the most important factor on the fisheries resources. Improper livestock management, through over grazing and/or over stocking can cause bank-trampling, reduction in riparian vegetation, increased bank

sloughing, increased sedimentation, changing streambank morphology and the lowering of the surrounding water table. Generally, in grazed areas, stream channels contain more fine sediment, streambanks are unstable, banks are less undercut, and water temperatures are higher than in streams where grazing is reduced. In these types of areas salmonid populations are reduced. With the increase in stream siltation from streambank trampling, the macro invertebrates species change from the desirable clean water species to species are not so desirable, "dirty" water species.

4.2.2.1 Effects of Alternative A: "Continue Livestock Grazing as Currently Authorized" on Issue #2

A high percentage of streambanks along westslope cutthroat fisheries would be trampled under existing management. Riparian inventories conducted along Cabin Creek in 1992 by the Montana Riparian Wetland Program recorded that livestock had trampled 60% to 95% of the streambanks along Simpson, Brians and Cabin Creeks. Subsequent field inspections by BLM personnel have documented extensive livestock-caused streambank alteration, trailing, trampling, and soil compaction along these stream reaches. Excessive streambank trampling and erosion were listed as partial reasons for a downward trend along Meadow Creek during a BLM riparian function assessment in 2000.

The height of perennial vegetation remaining along westslope cutthroat fisheries after grazing has varied from a high of six inches along Cabin Creek to less than one inch along bluegrass dominated streambanks. Where sedges occur, post grazing stubble height typically runs between two and four inches.

The overall results of continued grazing as currently authorized could be a continuing degradation of the stream bank and water quality. The effect on the WCT could be continued stress and either a continuing stability in the population and health or a slight decline in both.

4.2.2.2 Effects of Alternative B: "No Grazing on the Bear Creek Allotments" on Issue #2

No livestock grazing would promote the fastest recovery rate for aquatic and riparian habitat related to livestock impacts on public land. Livestock produced wastes and sediments would be eliminated along all stream reaches, improving water quality and aquatic habitat on public land.

Vegetative cover and overhanging banks would increase along all creeks ensuring more consistent, (cooler in summer, warmer in winter) water temperatures. The height of greenline vegetation would be limited only by wildlife use and climatic conditions. Beaked sedge could be expected to reach heights of 24 inches most years. Livestock-caused streambank alteration would nearly be eliminated with the possibility of unauthorized or recreational livestock occasionally trampling streambanks. Streambank trampling by wildlife would be expected to be negligible.

4.2.2.3 Effects of Alternative C: "Manage Livestock Grazing with Allowable Use Levels" on Issue #2

Up to 20% of the streambanks along westslope cutthroat fisheries would be trampled in any given year. There would be at least six inches of perennial vegetation left along theses same stream channels after a grazing treatment. These allowable use levels would allow vegetation and streambanks to stabilize and eventually this would result in better habitat and healthier trout populations. This would not promote the fastest improvement in the health of the WCT, but would eventually increase both the number and health.

4.2.2.4 Effects of Alternative D: "Extended Rest in the Simpson Creek and Indian Creek Pastures; Manage Livestock Grazing with Allowable Use Levels on all other units" on Issue #2

Westslope cutthroat trout habitat in Brians and Simpson Creeks would be ungrazed by livestock so conditions along these streams would be as described under Alterative B. Conditions along Cabin Creek would be as described under Alternative C. The allowed use would allow both the vegetation and streambanks to improve and that would improve the habitat for WCT. With improved habitat, WCT could expect to increase in number and health.

4.2.3 Predicted Effects on Sagebrush Habitats and Sagebrush Dependant Species (Issue #3)

Under all grazing alternatives, stock tanks, fence posts, and barbed wire would be long-term fixtures on public lands within the Bear Creek allotments. Livestock trampling of sagebrush and other vegetation around water developments, water gaps, salt grounds, and along fences, would be evident. This may result in a long-term loss of vegetation in proximity of developments. Increased stress and some wildlife losses can be expected from entanglement and collision with existing and proposed fences, despite mitigation efforts regulating wire spacing and fence placement. Social displacement of wildlife would occur annually as a result of livestock management and herding activities.

4.2.3.1 Effects of Alternative A: "Continue Livestock Grazing as Currently Authorized" on Issue #3

Under alternative A livestock would be permitted to graze the Meadow Creek Isolated allotment on May 1 and the Indian Creek Isolated allotment May 20. Grazing is permitted on the remaining allotments beginning June first and utilization standards are not implemented. This may not allow for adequate cover within sage grouse nesting and brooding habitat. Connelly et. al. 2000 recommends a perennial herbaceous cover averaging > 18 cm (~7 inches) height. This is critical during the early brooding period, as predation has been shown to be responsible for >90% mortality within the first two weeks. Cattle would be present on all allotments at least 45 days during the sage grouse nesting and early brood rearing season. By the end of summer, our documentation has shown that residual herbaceous cover may be as short as 1 - 2 inches.

This alternative provides the least protection to sagebrush habitats and dependant species. There are no requirements to adhere to interagency sage grouse habitat guidelines, and it does not provide site-specific upland or riparian allowable use levels. No fence modifications are proposed; therefore existing fences could continue to be barriers for wildlife, specifically antelope.

4.2.3.2 Effects of Alternative B: "No Grazing on the Bear Creek Allotments" on Issue #3

Wildlife habitat requirements would be optimized under this alternative. Competition for food, water, and space would be eliminated on the subject allotments if livestock were excluded. Grasses and sedges would be allowed to approach their full height potential, limited only by climatic factors and wildlife use. Taller bunchgrasses such as green needlegrass, bluebunch wheatgrass and basin wildrye would be expected increase on suitable habitats where seed sources are present. Even if wildlife utilization reached 15%, grass stubble heights would be maintained between 8 and 12 inches. Removal of interior fences and water developments would minimize wildlife barriers and restore a more natural view to the landscape. Over time, it is anticipated that areas of historic heavy livestock concentrations (salt grounds, stock tank locations) and trails would re-vegetate.

4.2.3.3 Effects of Alternative C: "Manage Livestock Grazing with Allowable Use Levels" on Issue #3

By implementing allowable use standards (table 2-1) on all allotments this alternative would help maintain sage grouse habitat. The June 15th turn out date will also comply with the recommendation of deferring livestock grazing until after June 10th to reduce disturbance and trampling during the nesting and brooding season.

Guidelines for management of sagebrush and sage grouse habitat focus on providing sagebrush and herbaceous cover that are critical during nesting and brooding. Implementing the stubble height standards provide for security from predators during these critical periods. The alternative also provides for periodic rest of the each pasture every four years. This will also help to maintain the residual herbaceous cover.

Cattle may be present on all allotments for no more than 30 days during the sage grouse nesting and early brood rearing season. Grass and sedge stubble heights would be maintained at 4 inches or higher throughout the growing season.

Also under Alternative C approximately 5 miles of barbed wire fence will be modified to make them "wildlife friendly." This will require moving the top wire down to between 38-40 inches and the bottom wire will be raised to at least 16 inches. Where woven wire fences are currently in place; openings will be cut to provide for antelope passage through the fence. One mile of new fence will be constructed within the Junction Allotment. This fence will also be fitted with a smooth bottom wire with a spacing of 16-6-6-12 for an overall height of 40 inches. This will help to reduce conflicts of big game movements across the allotments.

4.2.3.4 Effects of Alternative D: "Extended Rest in the Simpson Creek and Indian Creek Pastures; Manage Livestock Grazing with Allowable Use Levels on all other units" on Issue #3

Under this alternative, allowable use standards (table 2-1) implemented on all allotments would help maintain sage grouse habitat. The June 15th turn out date will also comply with the recommendation

of deferring livestock grazing until after June 10th to reduce disturbance and trampling during the nesting and brooding season. The pastures that would receive extended rest would allow for optimal habitat for sagebrush dependent species. Taller native bunchgrasses would be expected to increase on suitable habitats in the Simpson Creek pasture.

Guidelines for management of sagebrush and sage grouse habitat focus on providing sagebrush and herbaceous cover that are critical during nesting and brooding. Implementing the stubble height standards provide for security from predators during these critical periods. The alternative also provides for periodic rest of the each pasture every four years. This will also help to maintain the residual herbaceous cover.

Cattle may be present on authorized allotments for no more than 30 days during the sage grouse nesting and early brood rearing season. Grass and sedge stubble heights would be maintained at 4 inches or higher throughout the growing season.

This alternative approximately would modify 5 miles of barbed wire fence to make them "wildlife friendly." This would require moving the top wire down to between 38-40 inches and the bottom wire will be raised to at least 16 inches. Where woven wire fences are currently in place; openings will be cut to provide for antelope passage through the fence. One mile of new fence will be constructed within the Junction Allotment. This fence will also be fitted with a smooth bottom wire with a spacing of 16-6-6-12 for an overall height of 40 inches. This will help to reduce conflicts of big game movements across the allotments.

4.2.4 Predicted Effects on the grazing permittee's economic situation (Issue #4)

4.2.4.1 Effects of Alternative A: "Continue Livestock Grazing as Currently Authorized" on Issue #4

Under Alternative A, the permittee would be able to harvest the greatest amount of forage from BLM lands on an annual basis. During most years, they should be able to harvest approximately 1700 AUMs of forage from BLM lands, which represents over 95% of the active AUMs currently authorized to Bear Creek ranches.

Livestock management intensity and associated costs would remain the same as in previous years. Requirements for the permittee to monitor resource use would be minimal since the majority of the livestock moves would be based on calendar dates or at the permittee's discretion. Only in the Crystal Creek allotment would livestock moves be based on use levels.

This alternative amounts to a technical reduction of approximately 47 AUM's from current grazing preference. As a result of a reduction in permitted use levels the permittee has the option to reduce the number of livestock in the operation, transfer the use to private lands within the allotment, or acquire forage from other private sources. This loss of forage would cost the permittee approximately $633.00 per year to replace at current rates.

Alternative A doesn't require the permittee to construct any new projects, however maintenance of existing range improvement projects would be the permittee's responsibility, as it has in the past.

4.2.4.2 Effects of Alternative B: "No Grazing on the Bear Creek Allotments" on Issue #4

Alternative B would provide the least amount of livestock grazing since the Forest and BLM grazing leases would eventually be retired at the end of the current permit period. No forage (0 AUMs) would be available from BLM lands for use by the permittee. In order to compensate for this loss of forage, the permittee would be required to reduce herd size or rent or purchase additional pasture. Direct costs incurred by the permittee to replace forage lost would amount to an estimated $23,532.00 per year in to maintain size of the current livestock operation. As a result, the viability of maintaining a self-sustaining livestock operation on private base property in the allotments may be questionable.

Indirect cost to the permittee would also be incurred, since increased riding or herding may be necessary to keep cattle on private lands that are currently fenced in with public land. The permittee may opt to construct additional fences between BLM and private lands. The permittee would absorb the cost of these fences and would be responsible for future maintenance of these and any other BLM/private land boundary fences. The BLM would incur the costs of any fence modifications and project removal.

4.2.4.3 Effects of Alternative C: "Manage Livestock Grazing with Allowable Use Levels" on Issue #4

Under Alternative C, the permittee should be able to harvest approximately 1575 AUMs of forage from BLM lands annually, which represents 90% of the active AUMs currently authorized to Bear Creek Ranches. Direct costs incurred by the permittee to replace forage lost would amount to $2317.00 per year to maintain the current size of the livestock operation.

Livestock management is expected to intensify and associated costs would increase considerably as compared to Alternative A (No action.) The permittee would be required to monitor resource use since all livestock moves would be based on resource use or disturbance levels rather than on calendar dates. Annual placement of temporary electric fence &/or additional riding and herding would most likely be required to maximize forage harvest while staying within the allowable use levels presented in Table 2-1.

Alternative C allows the permittee to construct new projects. The BLM (or the Forest, if applicable,) would provide materials for these projects and the permittee would be expected to provide the labor for construction and future maintenance for these projects. BLM would incur the costs of any fence modifications.

4.2.4.4 Effects of Alternative D: "Extended Rest in the Simpson Creek and Indian Creek Pastures; Manage Livestock Grazing with Allowable Use Levels on all other units" on Issue #4

Under Alternative D, the permittee would be expected to harvest approximately 1325 AUMs of forage from BLM lands annually, which represents 75% of the active AUMs currently authorized to Bear

Creek Ranches. Direct costs incurred by the permittee to replace forage lost would amount to $5051.00 per year to maintain the current size of the livestock operation.

Livestock management intensity and costs would be very similar to that described for Alternative C and appreciably more than associated with Alternative A (No Action). One less move would be required since the Simpson Creek pasture would no longer be available for use and approximately one less mile of fence would have to be maintained since the native trout fence would be removed. BLM would incur the costs of fence removal and modification.

4.3 Cumulative Effects for all Alternatives

Cumulative impacts are those that result from adding the anticipated direct and indirect effects of the proposed action, to impacts from other past, present and reasonably foreseeable future actions. These additional impacts are considered regardless of what agency or person undertakes such actions. Past, present and reasonably foreseeable actions are discussed in Chapter 3 (existing condition) and summarized in Chapter 2 (Features Common to All Action Alternatives).

The physical impacts of cattle grazing and livestock management and monitoring activities on the Bear Creek allotments affect local resource conditions. These “federal actions” combined with livestock grazing and management on adjacent lands (private, state and federal), irrigation diversion, recreation, roads and wildlife use all influence the quality and perhaps the quantity of riparian, aquatic, and sagebrush habitats within Big Sheep Creek basin. Livestock and wildlife use and distribution within the cumulative impacts assessment area (EA, Section 3.5) may be affected as a result of revising livestock management on these allotments, however no major shifts in use patterns are anticipated. The effect of providing more herbaceous vegetation and residual cover under Alternative B, C , and D would enhance allotment specific wildlife habitat conditions. However, habitat on adjoining lands would continue to be both better and “worse”, so cumulatively would not substantially change any wildlife species distribution or occurrence.

Livestock grazing cumulatively impacts westslope cutthroat trout (WCT) habitat when combined with other factors. Improved livestock management or removal of livestock from these areas would benefit WCT habitat. Other factors such as competition and hybridization with non-native fishes, lack of connectivity, sedimentation, and dewatering by irrigation diversions would continue to influence WCT habitat quality and quantity irregardless of livestock presence. The impacts of water diverted for irrigation along Meadow Creek and Cabin Creek may have a greater influence on the long-term survivability of westslope cutthroat trout in these streams than does habitat alteration from livestock use. Irrigation diversions isolated the existing WCT populations from probable hybridization, and should be closely evaluated before reconnecting any streams. Connectivity may occur during high run off years between these upper reaches of Big Sheep Creek and the lower reaches of all these headwaters creeks and thus remain a potential threat to the pure strains of WCT.

4.3.1 Cumulative effects of Alternative A: “Continue Livestock Grazing as Currently Authorized”

Because this alternative perpetuates functional-at risk or nonfunctioning riparian conditions, downstream habitats would have to endure increased sediment delivery, higher energy flows and higher water temperatures. Unstable streambanks and over-widened stream channels would continue to erode while degrading water quality and aquatic habitats. Over the long-term, numbers of Westslope cutthroat trout in occupied habitat would be expected to decline. Small populations may be lost.

Under Alternative A the combined browsing and mechanical damage to willows from livestock, moose and elk may be sufficient to convert willow habitats to herbaceous dominated plant communities.

This alternative would have no different impact on area-wide wildlife habitat or uses than currently occurs.

4.3.2 Cumulative effects of Alternative B: "No Grazing on the Bear Creek Allotments"

Due to the anticipated improvement in riparian health and function on BLM lands, stream reaches located downstream from the Bear Creek allotments would eventually benefit from lower energy flows as well as decreased sediment levels, and more favorable temperature regimes. Physical changes to the environment along streambanks would provide improvements to the fisheries habitat and that in turn would improve the Westslope Cutthroat populations.

Willow regeneration would be restricted only by wildlife browsing which isn't expected to limit recruitment. Increases in willow canopy would be expected along all stream reaches that currently support willows with the possibility of converting herbaceous habitats along portions of Cabin, Simpson and Tex Creeks to willow types.

This alternative would slightly improve the availability of ungrazed habitat for a variety of wildlife species and uses, particularly those species requiring denser ground cover and residual vegetation. This may have a localized positive benefit to some species populations such as sage grouse, but would not substantially change any species occurrence or distribution.

Due to the loss of public land livestock forage, maintaining a self-sustaining livestock operation on private base property in the allotments may be questionable.

4.3.3 Cumulative effects of Alternative C: "Manage Livestock Grazing with Allowable Use Levels"

Due to the anticipated improvement in riparian health and function on BLM lands, stream reaches located downstream from the Bear Creek allotments would eventually benefit from lower energy flows as well as decreased sediment levels, and more favorable temperature regimes. Physical changes to the environment along streambanks would provide improvements to the fisheries habitat and that in turn would improve the Westslope Cutthroat populations.

Browsing and mechanical damage to willows from livestock should be negligible, however when added to browsing by moose and elk, the combined use may be sufficient to retard any expected

increases in willow canopy on some stream reaches. This may result in an eventual loss of willow canopy and or willow communities as stands mature and older plants die.

The intensity and duration of livestock use may increase on Bear Creek Ranches private land due to decreased forage availability on public land. Corresponding impacts to aquatic and terrestrial habitats on private land would be proportional to the increase in livestock use.

4.3.4 Cumulative effects of Alternative D: "Extended Rest in the Simpson Creek and Indian Creek Pastures; Manage Livestock Grazing with Allowable Use Levels on all other units"

Due to the anticipated improvement in riparian health and function on BLM lands, stream reaches located downstream from the Bear Creek allotments would eventually benefit from lower energy flows as well as decreased sediment levels, and more favorable temperature regimes. Physical changes to the environment along streambanks would provide improvements to the fisheries habitat and that in turn would improve the Westslope Cutthroat populations.

Willow canopies are expected to increase along Simpson, Brians and Indian Creek. Willow canopies along all other stream reaches are expected to remain constant over the short-term with possible declines as mature willows die out.

As with Alternative C, impacts to aquatic and terrestrial habitats on private land would intensify proportionally to the increase in livestock use.

4.4 Critical Elements of the Human Environment

A summary of whether critical elements of the human environment are affected by the proposed action is presented in table 4-1.

Table 4-1. Review of Critical Elements of the Human Environment

Critical Element	Affected		Critical Element	Affected	
	Yes	No		Yes	No
Air Quality		X	T&E Species		X
ACECs		X	Wastes, Hazardous/Solid		X
Cultural Resources		X	Water Quality	X	
Farmlands, Prime/Unique		X	Wetlands/Riparian Zones	X	
Floodplains	X		Wild & Scenic Rivers		X
Native American Religious Concerns		X	Wilderness		X
Environmental Justice		X	Invasive, Nonnative Species	X	

The Proposed Action would not affect air quality, hazardous wastes, cultural resources, Native American religious concerns, or prime farmlands. No wild and scenic rivers, wilderness or wilderness study areas are within or adjacent to the Bear Creek allotments. No low income or minority groups would be disproportionately impacted as a result of this project.

Currently there are no Areas of Critical Environmental Concern (ACECs) in the project area, but all BLM lands within Big Sheep Creek Basin, which includes all of the allotments leased to Bear Creek Ranches, have been nominated for ACEC consideration in the draft Dillon Resource Management Plan. Threatened and endangered species would not be affected by this action however several sensitive plant species could be affected as discussed in chapters 3 and 4 and the biological evaluation summary (Appendix F). The affects on water quality, riparian areas, flood plains, wetlands and nonnative species are discussed and disclosed in chapters 3 and 4.

CHAPTER 5.0 LIST OF PREPARERS – CONSULTATION/COORDINATION

5.1 List of Preparers

The Bear Creek Ranches Management Plan Interdisciplinary (ID) Team prepared this environmental analysis. The ID Team developed the management alternatives for this environmental assessment in close consultation and coordination with Bear Creek Ranches Inc. Complete agendas and minutes of the Bear Creek Ranches Management Plan ID Team meetings are on file at the BLM Dillon Field Office.

Bear Creek Ranches Management Plan ID Team:

Brian Hockett	Rangeland Management Specialist, Team Lead
Jim Roscoe	Wildlife Biologist
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Other BLM personnel briefed and/or consulted during the preparation of this analysis:

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5.2 Consultation/Coordination

5.2.1 Persons and Agencies Consulted

The following individuals organizations and agencies were consulted during the preparation of the document and/or were provided a copy of this environmental assessment.

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Al Nixon, Montana Department of Environmental Quality

Beaverhead-Deerlodge National Forest
Montana Fish, Wildlife and Parks
National Wildlife Federation
Gallatin Wildlife Association
Western Watersheds Project
American Wildlands

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5.4 Appendices

Appendix A Vicinity and local maps of the allotments (not available on web)

Appendix B Map showing fences & livestock watering facilities (not available on web)

Appendix C Monitoring plan (not available on web)

Appendix D Map showing individual stream reach and wetland locations (not available on web)

Appendix E Map showing “Issue-based Fish & Wildlife Habitat” (not available on web)

Appendix F Biological evaluation summaries for special status species (not available on web)